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Preface

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## Preface

Let us quote a few lines from the preface to the proceedings of the seminar Programs and Algorithms of Numerical Mathematics 1 (1983). (The publication is in Czech available at the library of the Institute of Mathematics of the Czech Academy of Sciences in Prague.)

“In numerical mathematics of the last decade, the inclination to the algorithmic as well as programming aspects is apparent. The domain of numerical software also has been intensively developing in Czechoslovakia in the present period. The aim of the seminar Programy a algoritmy numerické matematiky (Programs and Algorithms of Numerical Mathematics, PANM), organized by the Mathematical Institute of the Czechoslovak Academy of Sciences in Alšovice on June 6–10, 1983, was to increase mutual awareness and to unite the effort of experts working in this area.

The program of the seminar was focused on practical implementation of numerical algorithms, and establishing program (computer code) archives and libraries, their performance and experience with them.”

In fact, that was the period when several basic books comprising fundamental algorithms from different fields of numerical analysis appeared, when sophisticated programming languages arose, and when the first personal computers emerged. That was also the period when the enormous effort of many people to build general numerical program libraries started. The first series of numerical seminars in Czechoslovakia, Software and Algorithms of Numerical Mathematics, was initiated by Ivo Marek (1933–2017) from Charles University and his colleagues in 1975.

We have opened the PANM seminar series in Alšovice, a village near Železný Brod (Eisenbrod) in Jablonec nad Nisou (Gablonz) District, where the Czechoslovak Academy of Sciences had a training and recreation center for about 30 people. The village is on a hill several kilometers north of the Jizera River. Further north of Alšovice, the Jizera Mountains begin and continue north to Poland.

The first organizing committee was composed of Milan Práger (1930–2020), Petr Příkryl, and Karel Segeth. Naturally, we did not know that we started a series of biennial seminars and that the seminars would take place – with one exception – in the Jizera Mountains and their vicinity. This exceptional seminar was held in Prague on the occasion of Professor Ivo Babuška’s 80th birthday in 2006.

Almost 40 years ago, it was no fun to organize a seminar for several tens of people. There was no Internet, we were sending all information in paper letters by surface mail. There was no  $\text{\TeX}$  and no data projectors. The most common way of holding a lecture was to speak without microphone and write formulas with chalk on the blackboard.

To be historically correct, we present a table of the individual seminars including the year and venue.

1 Alšovice 1983	11 Dolní Maxov 2002
2 Alšovice 1984	12 Dolní Maxov 2004
3 Alšovice 1986	13 Praha 2006
4 Alšovice 1988	14 Dolní Maxov 2008
5 Alšovice 1990	15 Dolní Maxov 2010
6 Bratříkov 1992	16 Dolní Maxov 2012
7 Bratříkov 1994	17 Dolní Maxov 2014
8 Janov n. N. 1996	18 Janov n. N. 2016
9 Kořenov 1998	19 Hejnice 2018
10 Libverda 2000	20 Hejnice 2020

This year's 20th seminar PANM was held in the International Center for Spiritual Rehabilitation, Hejnice, Czech Republic, June 21–26, 2020. These proceedings contain peer-reviewed papers that were presented at the seminar as invited lectures, survey lectures, short communications, and posters. All papers have been reproduced directly from materials submitted by the authors. Two photographs of the seminar participants in the garden of the Center are also included.

The seminar was organized by the Institute of Mathematics of the Czech Academy of Sciences under the auspices of EU-MATHS-IN.cz, the Czech Network for Mathematics in Industry, and with the financial support provided by the RSJ Foundation to which we express our sincere gratitude.

All the time, the objective of this series of seminars is to provide a forum for presenting and discussing advanced topics in numerical analysis, computer implementation of numerical algorithms, scientific computing, modern approaches to mathematical and physical modeling, parallel algorithms, and computation on parallel architectures.

The action was influenced by the epidemical situation in the Czech Republic as well as abroad. Finally, 49 people working in the field of scientific computing and related areas took part in the seminar, most of them from Czech universities and from institutes of the Czech Academy of Sciences. We are happy to see that the participation of a number of young scientists, PhD students, and also some undergraduate students has become a tradition at the seminar. We appreciate very much that the PANM participants physically took part in Hejnice regardless of the COVID-19 epidemic.

The organizing committee consisted of Jan Chleboun, Pavel Kůs, Petr Přikryl, Miroslav Rozložník, Karel Segeth, Jakub Šístek, and Tomáš Vejchodský. Ms Hana Bílková kindly helped in preparing manuscripts for print.

The editors and organizers wish to thank all the participants for their valuable contributions and, moreover, all the scientists who took their share in reviewing the submitted manuscripts for their effort.

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